

REMARKS

Reconsideration and allowance of this application are respectfully requested in light of the above amendments and the following remarks.

At the outset, the Applicant wishes to thank the Examiner for the courtesy shown to his representative during a telephone interview on August 5, 2010. The participants were Examiner Donabed and Douglas Agopsowicz, Reg. No. 56,792. The following includes a summary of the substance of the interview. No agreement was reached.

During the interview, the discussion focused on the rejections of claims 9-15, 17-19, and 21-22 made in the Office Action mailed May 7, 2010, and particularly on independent claims 9 and 12. The prior art references “Fast Handover Algorithm for Hierarchical Mobile IPv6 macro-mobility Management,” Vivaldi et al. (hereinafter, “Vivaldi”) and U.S. Printed Publication No. 2002/0199104 to Kakemizu et al. (hereinafter, “Kakemizu”) were discussed.

During the interview, the Applicant’s representative began by explaining the problems associated with mobile handovers in the conventional art, including the problem that when a mobile node migrates from a first Mobility Anchor Point (MAP) to a second MAP, it is conventionally necessary for the mobile node to register two care-of addresses: a “Regional Care-Of Address,” (or “RCOA”) and an “On-Link Care-Of Address” (or “LCOA”), which results in delay. Also, the Applicant’s representative explained that installing MAPs hierarchically to solve this conventional problem results in a massive increase in the number of MAPs, which is another problem in the conventional art.

The Applicant’s representative then explained how the Applicant solved this problem, and discussed the features of amended claim 9 with Examiner Donabed, including the feature of how the “second care-of address” is used with the “predetermined cells,” as recited by amended

claim 9. The Applicant's representative explained how the communication system recited by amended claim 9 solved the conventional problems identified in the background section of the application, including how the recited "second care-of address" (e.g., a RCOA) is used with the recited "predetermined cells" located on either side of a boundary between the MAPs to reduce delay by enabling the communication terminal apparatus to only register a single care-of address during migration between MAPs.

The Applicant's representative then explained why the portions of Kakemizu (paragraphs [0196]-[0203]) cited in the Office Action fail to disclose various features recited by amended claim 9, including the "predetermined cells" feature. Furthermore, it was noted by the Applicant's representative that paragraph [0203] of Kakemizu disclosed the conventional migration method between MAPs which would suffer from the same problems as those problems that the Applicant was overcoming by the communication system recited by claim 9. The Applicant's representative noted that, since Kakemizu disclosed a conventional migration method, the care-of addresses disclosed by Kakemizu (including the care-of address issued upon roaming) were different from the second care-of address recited by amended claim 9 which is used with the predetermined cells. (See claim 9).

Although no agreement was reached, Examiner Donabed indicated that he would need to review the rest of Kakemizu to determine whether the features of amended claim 9 and the other claims were disclosed by the prior art.

Examiner Donabed did agree that the proposed claim amendments appeared to overcome the 35 U.S.C. § 112, second paragraph rejections.

Accordingly, it is respectfully submitted that the above-described features of independent claims 9 and 12 and the remaining claims depending therefrom are not rendered obvious by the

combination of Vivaldi and Kakemizu, and that the rejections of the pending claims should be withdrawn for at least this reason.

In addition to the arguments summarized above, a more detailed explanation as to why the amended claims are patentably distinct over the prior art, and why the rejections of the claims should be withdrawn, is included below.

Claims 9, 12, 15, 17, 19, and 21 have been amended to overcome the 35 U.S.C. § 112, second paragraph, and 35 USC 103 rejections, and to correct minor grammatical errors. Support for the amendments is provided, for example, at paragraph [0035], table 1, and FIG. 4 of the published U.S. application. (It should be noted that references to the specification and drawings throughout this Amendment are for illustrative purposes only and are not intended to limit the scope of the invention to the referenced embodiments.)

Claims 9-15, 17-19, and 21-22 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which applicant regards as the invention. Specifically, claims 9 and 12 recited the phrase “a home agent that: registers, in association with one another,” and the Office Action alleges that this phrase is “vague and unclear as to what the ‘one another’ actually is or what it encompasses.” Claims 9 and 12 have been amended to remove this phrase. Accordingly, it is respectfully submitted that the rejections of claims 9-15, 17-19, and 21-22 under 35 U.S.C. § 112, second paragraph should be withdrawn.

Claims 9, 10, 12, 13, and 15-22 were rejected, under 35 USC §103(a), as being unpatentable over Vivaldi in view of Kakemizu. Claims 11 and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Vivaldi in view of Kakemizu and further in view of Chubbs III (United States Patent Number 6,400,304) (hereinafter, “Chubbs”). To the extent that

these rejections may be deemed applicable to the amended claims presented herein, the Applicant respectfully traverses as follows.

By way of review, a problem with one method in the conventional art is that, when a mobile node is moving and performs a handover from a first Mobility Anchor Point (MAP) to a second MAP, it is necessary for the mobile node to register two care-of addresses: one care-of address (a “Regional Care-Of Address,” or “RCOA”) with the second MAP, and another care of address (an “On-Link Care-Of Address,” or “LCOA”) with a Home Agent (HA). (Published U.S. Application, par. [0008]-[0011]; see also FIG. 3). Registering two care-of addresses during the migration, however, results in delay. To solve this problem, one proposed method which has been considered involves installing MAPs hierarchically. (Published U.S. Application, par. [0012]). However, installing MAPs hierarchically leads to another problem, namely that the hierarchical method requires employing an extremely large number of MAPs in order for the communication system to operate correctly. (Published U.S. Application, par. [0013]).

Thus, the Applicant’s claim 9 is directed towards a communication system which enables a significant reduction in delay in handover between Mobility Anchor Points (MAPs) without increasing the number of MAPs required to be installed. (Abstract). To achieve this, the Applicant’s claim 9 recites the features of:

“9. (Currently Amended) A communication system comprising:

a communication terminal apparatus;

a plurality of access routers that communicate with the communication terminal apparatus;

a first mobility anchor point that controls an access router subordinate under the first mobility anchor point among the plurality of access routers, issues a first care-of address and a second care-of address, and transmits the issued first care-of address and the issued second care-of address through a network;

a second mobility anchor point that controls another access router subordinate under the second mobility anchor point among the plurality of access routers, and that is adjacent to the first mobility anchor point across a boundary with the first mobility anchor point; and

a home agent that:

transmits data, transmitted to a home address of the communication terminal apparatus, to a destination indicated by at least one of the first care-of address and the second care-of address, wherein:

the first care-of address can only be used in cells of the first mobility anchor point;

the second care-of address can only be used in predetermined cells;

the predetermined cells:

(i) only include a first cell group, which is part of the cells of the first mobility anchor point, and a second cell group, which is part of the cells of the second mobility anchor point, the second cell group of the second mobility anchor point being adjacent to the first cell group of the first mobility anchor point across the boundary with the first mobility anchor point, and

(ii) do not include at least one of (a) a third cell, which is part of the cells of the first mobility anchor point, and (b) a fourth cell, which is part of the cells of the second mobility anchor point; and

the home agent registers the home address of the communication terminal apparatus, the first care-of address transmitted through the network and the second care-of address transmitted through the network, wherein:

the home address of the communication terminal apparatus, the first care-of address and the second care-of address are associated with each other.”

Thus, as generally recited in amended claim 9, features of the communication system according to aspects of the present invention include that a second care-of address issued by a first mobility anchor point can be used in predetermined cells and cannot be used in cells other than the predetermined cells, and the predetermined cells include a first cell group, which is part of the cells of the first mobility anchor point, and a second cell group, which is part of the cells

of the second mobility anchor point, the second cell group of the second mobility anchor point being adjacent to the first cell group of the first mobility anchor point across the boundary with the first mobility anchor point. According to this communication system of the Applicant’s claim 9, when a mobile node moves to a cell on either side of the boundary between the first and second MAPs, the second care-of address (e.g., an RCOA), which is used with predetermined cells located on either side of the boundary, is registered with the HA. Then, if the mobile node migrates across the boundary to the cells subordinate to the second MAP, the mobile node registers another care-of address (e.g., an LCOA) with the second MAP. Since the mobile node had previously registered the second care-of address (the RCOA), the mobile node is not required to register this second care-of address again during the migration to the cells subordinate under the second MAP. Therefore, during the handover between MAPs, the mobile node can only register one care-of address (the LCOA) with the second MAP, instead of two care-of addresses (the LCOA and the RCOA, as occurs in the conventional art), and still have communications be enabled, thereby largely reducing the delay in handover between MAPs. (Published U.S. Application, par. [0046]).

In the rejection of the Applicant’s claim 9, the Office Action alleges that Vivaldi discloses some features of claim 9, and further alleges that paragraphs [0196]-[0203] and FIGs. 18 and 19 of Kakemizu discloses the remaining features of claim 9 not disclosed by Vivaldi. Specifically, the Office Action alleges that “Kakemizu teaches a first mobility anchor point that issues the first care-of address and the second care-of address” (see Office Action, page 4, bottom). The Office Action further alleges that Kakemizu discloses “a second mobility anchor point that is adjacent to the first mobility anchor point across a boundary with the first mobility anchor point” (see Office Action, page 4, bottom).

However, the communication system recited by the Applicant's claim 9 differs from Kakemizu in that the second care-of address recited by claim 9 can be used in both the first mobility anchor point and the second mobility anchor point. More specifically, the second care-of address can be used in predetermined cells, which (i) only include a first cell group, which is part of the cells of the first mobility anchor point, and a second cell group, which is part of the cells of the second mobility anchor point, the second cell group of the second mobility anchor point being adjacent to the first cell group of the first mobility anchor point across the boundary with the first mobility anchor point, and (ii) do not include at least one of (a) a third cell, which is part of the cells of the first mobility anchor point, and (b) a fourth cell, which is part of the cells of the second mobility anchor point. (see claim 9). As explained above, this feature is significant because, by registering this second care-of address when the mobile node is at the predetermined cells, then, if a handover between MAPs does occur, the mobile node can register only a single care-of address (e.g., a LCOA) to enable communications, thereby largely reducing the delay in handover between MAPs. (Published U.S. Application, par. [0046]).

It is respectfully submitted that Kakemizu does not disclose the feature of the "second care-of address" recited by claim 9. The differences between the communication system recited by claim 9 and Kakemizu will be explained in more detail below.

The system of Kakemizu relates to Internet service and discloses issuing a care-of address when a mobile node roams in the second mobility anchor point from the first mobility anchor point (see paragraph [0203] of Kakemizu). The Office Action alleges that the care-of address in Kakemizu issued upon roaming corresponds to the second care-of address recited by claim 9.

However, Kakemizu only discloses that the care-of address issued upon roaming is an address for identifying a mobility anchor point (see paragraph [0203] of Kakemizu), but does not disclose that this care-of address can be used in both the first mobility anchor point and the second mobility anchor point.

Furthermore, Kakemizu does not disclose that the care-of address issued upon roaming is only used in some cells of the first and second mobility anchor point, but not others. In contrast, the Applicant's claim 9 recites the feature that "the second care-of address can only be used in predetermined cells," and the predetermined cells are defined as not including certain cells, i.e., a "third cell" which is part of the cells of the first mobility anchor point, and (b) a "fourth cell," which is part of the cells of the second mobility anchor point.

That is, the care-of address of Kakemizu issued upon roaming can be used only in a single mobility anchor point, and therefore might possibly correspond to the "first care-of address" recited by the Applicant's claim 9, but clearly does not correspond to the "second care-of address" recited by claim 9. Specifically, Kakemizu discloses the following:

"[0202] In the hierarchical mobile IPv6, the location of a mobile node (MN) is identified by an RCOA (regional care-of address) and an LCOA (local care-of address). The RCOA is an address for identifying the mobility anchor point (MAP) for managing the communications area in which the mobile node is located. The LCOA is an address used in an area managed by each mobility anchor point.

[0203] In FIG. 18, when a mobile node (MN) roams from an area managed by a mobility anchor point (MAP-A) to an area managed by another mobility anchor point (MAP-B), the notification of the RCOA is issued to the home agent, and the notification of the LCOA is issued to the mobility anchor point (MAP-B). On the other hand, if the mobile node moves within an area managed by one mobility anchor point, then the location is recorded in the mobility anchor point, but the location is not recorded in the home agent. As a result, the access to the home agent can be reduced, thereby reducing the load on the network, and realizing a high-speed process performed when the mobile node

is moved. The mobility anchor point is described in detail in <draft-ietf-mobileip-hmipv6-02.txt> issued by the IETF (emphasis added)."

As set forth above, Kakemizu simply discloses that when a MN roams from an area managed by one mobility anchor point (MAP-A) to an area managed by another mobility anchor point (MAP-B), the MN notifies the HA of the RCOA (to identify the new mobility anchor point, MAP-B), and notifies the new mobility anchor point (MAP-B) of the LCOA (to identify where the MN is located within the area managed by MAP-B). However, as explained above, this disclosure is substantially the same as the disclosure set forth in the background section of the Applicant's application itself, and is a conventional aspect of migrating between MAPs.

Specifically, the background section of the application explains that:

"In the aforementioned constitution using MAPs, it is necessary to register the care-of address with both the MAP [the LCOA] and HA [the RCOA] in handover between MAPs. It is thus an issue to reduce delay time in handover between MAPs." (Paragraph [0011]; see also FIG. 3, depicting conventional process of registering both RCOA and LCOA during migration).

As explained in detail above, the communication system recited by claim 9 solves this exact problem by reciting a "second care of address" which is only used in predetermined cells at a boundary of the MAPs, and the predetermined cells overlap between cells managed by a first mobility anchor point and a second mobility anchor point. As a result, during the handover between MAPs, the mobile node only has to register a single care-of address (e.g., a LCOA with the new MAP) to enable communications, thereby largely reducing the delay in handover between MAPs. (Published U.S. Application, par. [0046]).

Accordingly, Kakemizu fails to disclose the feature of a "second care-of address" that can be used in both the first mobility anchor point and the second mobility anchor point as recited by

claim 9, i.e., that can be used in predetermined cells which include both of a first cell of the first mobility anchor point and a second cell of the second mobility anchor point.

Furthermore, the system of Kakemizu relates to Internet service and fails to disclose or suggest a communication system having a cellular network as claimed in claim 9.

Also, since Kakemizu discloses the same configuration as the configuration disclosed in the background section of the Applicant's application, the system of Kakemizu would suffer from the same problems as those described in the background section of the application. For example, in the system disclosed by Kakemizu, a mobile node migrating from one MAP to another MAP would experience delays caused by having to register two care-of addresses during migration.

Moreover, as acknowledged in the Office Action (pg. 4), Vivaldi fails to disclose the recited "second care-of address" recited by claim 9. Furthermore, Chubbs does not disclose, either expressly or inherently, the recited "second care-of address" recited by claim 9.

Claim 12 has been amended to recite substantially similar features as those features recited by claim 9 and discussed above.

Accordingly, it is respectfully submitted that the rejection of the Applicant's claims 9 and 12 and all claims depending therefrom should be withdraw for at least these reasons.

In view of the above, it is submitted that this application is in condition for allowance and a notice to that effect is respectfully solicited.

If any issues remain which may best be resolved through a telephone communication, the Examiner is requested to telephone the undersigned at the local Washington, D.C. telephone number listed below.

Respectfully submitted,

/James E. Ledbetter/

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JEL/DEA/

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